Setup Guide

Matrix Switchers

IMPORTANT:
Refer to www.extron.com for the complete user guide and installation instructions before connecting the product to the power source.

FOX Matrix 320x
FOX Matrix 14400

Configurable Fiber Optic Digital Video Matrix Switchers

Extron USA - West Headquarters	Extron USA - East	Extron Europe	Extron Asia	Extron Japan	Extron China	Extron Middle East
+800.633.9876 Inside USA and Canada Only	+800.633.9876 Inside USA and Canada Only	+800.3987.6673 Inside Europe Only	+800.7339.8766 Inside Asia Only	+81.3.3511.7655 +81.3.3511.7656 FAX	+400.883.1568 Inside China Only	+971.4.2991800 +971.4.2991880 FAX
+1.714.491.1500 +1.714.491.1517 FAX	+1.919.863.1794 +1.919.863.1797 FAX	+31.33.453.4040 +31.33.453.4050 FAX	+65.6383.4400 +65.6383.4664 FAX		+86.21.3760.1568 +86.21.3760.1566 FAX	

Extron® Electronics
INTERFACING, SWITCHING AND CONTROL

68-1539-50 Rev. C
10 10

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Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • **I**f the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta bateria únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron USA
1001 East Ball Road
Anaheim, CA 92805
U.S.A.

Europe, Africa, and the Middle East:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

Asia:
Extron Asia
135 Joo Seng Road #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Japan:
Extron Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Middle East:
Extron Middle East
Dubai Airport Free Zone
F12, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or modifications to the product that were not authorized by Extron.

NOTE: If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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Introduction

WARNING: The fiber optic I/O boards of the FOX matrix switchers output continuous invisible light, which may be harmful to the eyes; use with caution.

- ***Do not look*** into the fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

This section gives an overview of the Extron® FOX Matrix 320x and FOX Matrix 14400 and describes their features. Topics that are covered include:

- About this Guide
- About the FOX Matrix Switchers

About this Guide

NOTE: Throughout this guide, both products are referred to as "FOX matrix switchers" unless a significant difference is noted in their features or operation.

This setup guide helps you to easily and quickly set up and configure your FOX Matrix 320x or FOX Matrix 14400. Step by step instructions show you how to:

- **Connect the hardware**
- **Use selected Simple Instruction Set (SIS™) commands to perform basic operations**
- **Load and start the Windows®-based Matrix Switchers Control Program**
- **Connect to the built-in HTML pages, which you can use to operate the switcher**
- **Replace the I/O boards, power supplies, and fans**

About the FOX Matrix Switchers

The FOX.matrix.switchers.(see figure 1.for.a.FOX.Matrix.14400. example).are configurable matrix.switchers.that.distributes.optical. signals..Fiber.optic.I/O.boards.route signals.that.are compatible with. all.Extron.FOX.500,.FOXBOX,.FOX.3G.HD-SDI,.and.FOX.2G.fiber. optic.product.lines..The matrix.switcher.routes.any.input.signal.to. any.combination.of.outputs..The matrix.switcher.can.route multiple input/output.configurations.simultaneously.

The Extron.proprietary.fiber.optic.signal.that.is.generated.by. Extron.fiber.optic.transmitters,.can.include video,.stereo.audio,. and.transmitter-to-receiver.RS-232.serial.communication..The video. component.of.the signal.can.be RGB.video,.Digital.Visual.Interface (DVI).video,.SDI/HD-SDI.video,.or.low.resolution.video,.depending.on. the transmitter.and.receiver.

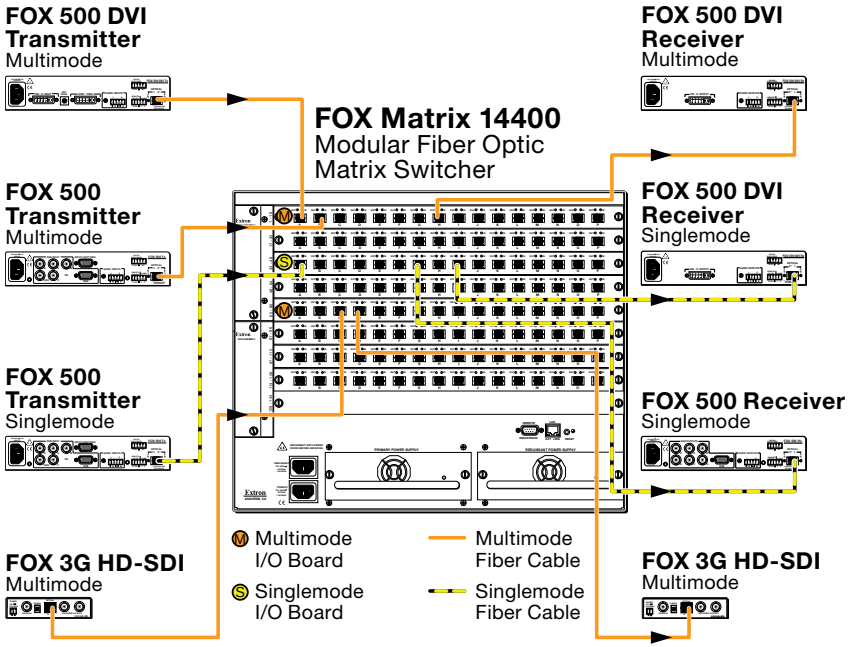

FOX 500 DVI Transmitter Multimode
FOX 500 DVI Receiver Multimode
FOX Matrix 14400
Modular Fiber Optic Matrix Switcher
FOX 500 Transmitter Multimode
FOX 500 DVI Receiver Singlemode
FOX 500 Transmitter Singlemode
FOX 500 Receiver Singlemode
FOX 3G HD-SDI Multimode
FOX 3G HD-SDI Multimode
M Multimode I/O Board
S Singlemode I/O Board
Multimode Fiber Cable
Singlemode Fiber Cable

Figure 1. Typical FOX Matrix 14400 Application

The matrix.switcher.can.be remotely.controlled.via.its.Ethernet.LAN. port.or either.of.two.serial.ports,.one on.the rear.panel.and.one on.the front.panel,.using either.the Windows-based.Extron.Matrix. Switchers.Control.Program.or.the SIS.

The switcher.has.two.(FOX.Matrix.14400).or.four.(FOX.Matrix.320x). internal,.hot-swappable 100.VAC.to.240.VAC,.50-60.Hz,.400-watt. power.supplies.that.provide worldwide power.compatibility.and. reliability.

NOTES:.
- Compatible optical.signals.are digital.signals.from. 270.Mbps.through.4.25.Gbps.that.are sent.and. received.via.fiber.optic.small.form.factor.pluggable (SFP).modules..The FOX.matrix.switchers.support.all. compatible optical.signals,.whether.transmitted.or. received.by.an.Extron.fiber.optic.system.component.or. not.
- The FOX.transmitter-to-receiver.communications,. including.the serial.link,.occupy.one matrix.switcher. input.and.output.. This.matrix.switcher.can.also.support.the FOX.return. (receiver-to-transmitter).serial.communications,.but. returning.this.signal.stream.to.the transmitter.occupies. a.separate matrix.switcher.input.and.output.

Configurability and transmission modes

The FOX.matrix.switcher.is.assembled.from.individual.input/output. (I/O).boards..The switcher.can.include up.to.9.(FOX.Matrix.14400).or. 20.(FOX.Matrix.320x).I/O.boards, each.of.which.supports.16.inputs.by. 16.outputs..The two.types.of.I/O.boards.are:

Singlemode fiber optic 16x16 I/O board, equipped.with.removable fiber.optic.transceiver.modules

Multimode fiber optic 16x16 I/O board, equipped.with.removable fiber.optic.transceiver.modules

NOTE:. As.listed.above,.two.versions.of.the fiber.optic.I/O.boards. are documented.in.this.manual..They.are categorized.by. the type of.fiber.optic.cable,.multimode or.singlemode,. which.defines.the effective range of.transmission:

- **Singlemode** —.Very.long.distance,.up.to.30.km (18.75.miles)
- **Multimode** —.Long.distance,.up.to.300.m (984.feet)

By.adding.or.removing.I/O.boards,.you.can expand.and.contract.the FOX.matrix.switcher.from.an.16-input.by.16-output.matrix.up.to.a. 144-input.by.144-output.matrix.(FOX.Matrix.14400).or.320-input.by. 320-output.matrix.(FOX.Matrix.320x).

NOTE:. On.a.fiber.optic.I/O.board.as.delivered.from.Extron,. all.transceiver.modules.are configured.the same:. either.all.multimode or.all.singlemode..You.can.mix. multimode and.singlemode fiber.optic.I/O.boards.in. a.FOX.matrix.switcher,.but.you.must ensure that.you. connect.the proper.transmission.mode fiber.cables.to.the board.

Installation

This.section.describes.installation.of.the FOX.matrix.switchers,. including.connections.and.features..Topics.that.are covered.include:

- Rear.Panel
- Front.Panel

Rear Panel

A Note on I/O Boards

As.shown.in.figure 2, each.I/O.board.is.identified.by.the input.and. output.numbers.supported.by.the board.position..The transceiver. modules.on.the boards.are identified.as.A.through.P.

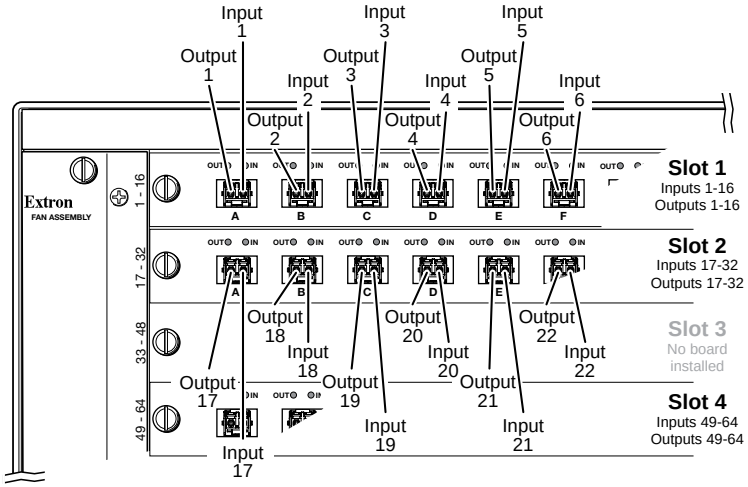


Figure 2. Arrangement of Inputs and Outputs on the I/O Boards

The board.position.designators.correspond.to.the input.and.output. numbers.served.by.that.position.(1.-.16,.17.-.32,.and.so.on).

The location.designators,.A.through.P,.correspond.to.the transceiver. modules,.numbered.from.left.to.right, each.of.which.includes.an. input.and.an.output.

See figure 2..The input.and.output.numbers.supported.by.the I/O.board.in.location.17.-.32.are as.follows:.A.=.17,.B.=.18,.C.=.19,. D.=.20,.and.so.on.

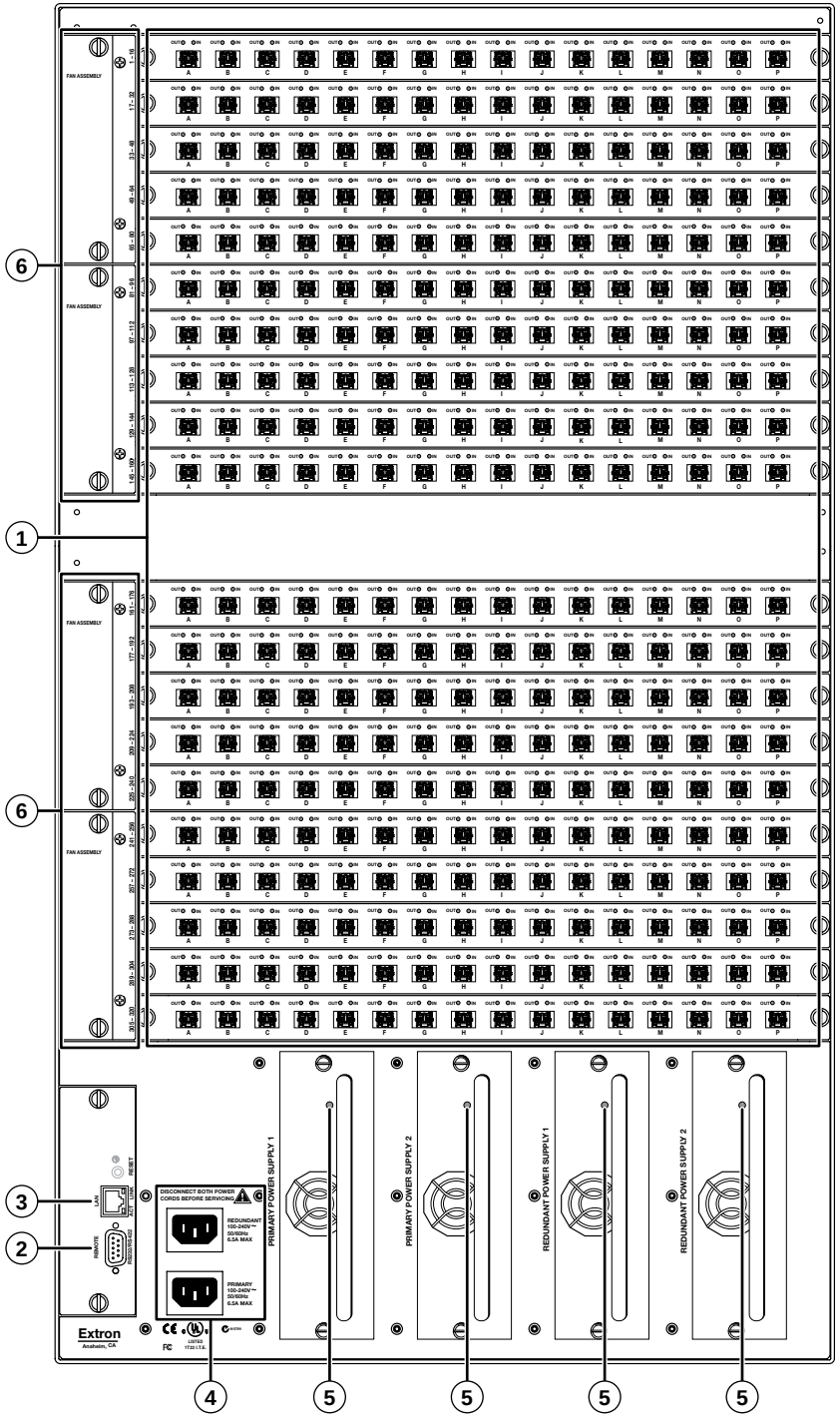


Figure 3. FOX Matrix 320x Rear Panel

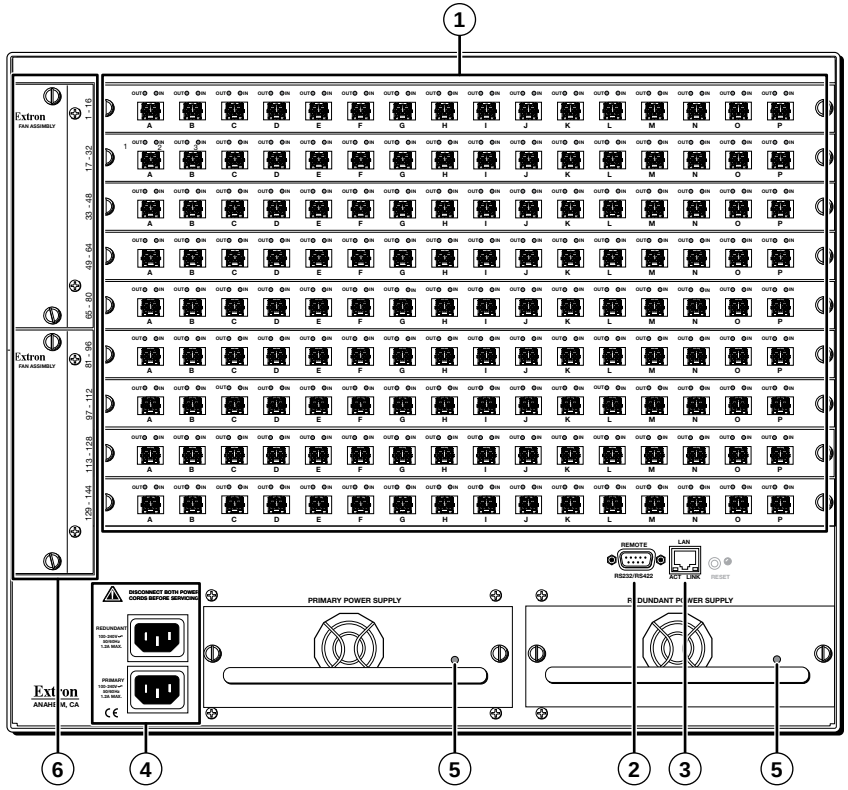


Figure 4. FOX Matrix 14400 Rear Panel

① **Fiber optic connectors and LEDs** — See page 8.

② **Remote port** — See page 9.

③ **Ethernet connection (LAN connector)** — See page 9.

④ **Power connectors** — See page 9.

⑤ **Power indicator LEDs** — See page 9. Power supplies are hot swappable, see Maintenance and Modifications to replace the power supply.

⑥ **Replaceable fans** — See Maintenance and Modifications to replace the fan.

Making connections

① **Fiber optic connectors and LEDs —**

WARNING: This unit outputs continuous invisible light, which may be harmful to the eyes; use with caution. For additional safety, plug the attached dust caps into the optical transceivers when the fiber cable is unplugged.

NOTES:
- Ensure that you use the proper fiber cable for your I/O board. Typically, single mode fiber has a yellow jacket and multimode cable has an orange or cyan jacket.
- The FOX matrix switcher uses one connector on the block as an input and the second connector on the same block as a separate output.

1a **Input connector —** Connect a fiber optic cable between each Input LC connector and a FOX 500 Tx or any other compatible Extron FOX device.

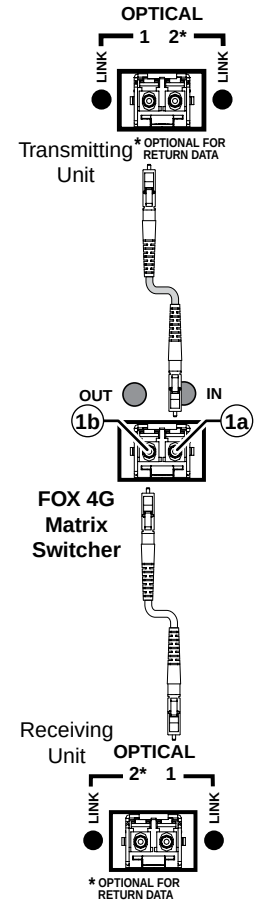
NOTE: Or, for the serial return (receiver-to-transmitter) function, connect the far end to the Optical 2 connector on a FOX Rx receiver.

Input LED — When lit, the link is active (light is received).

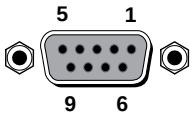
1b **Output connector —** Connect a fiber optic cable between each output LC connector and a FOX 500 Rx or any other compatible Extron FOX device.

NOTE: Or, for the serial return (receiver-to-transmitter) function, connect the far end to the Optical 2 connector on a FOX Tx transmitter.

Output LED — This LED is always lit.



② **Remote port —** If desired, connect a control system or computer to the rear panel Remote RS-232/RS-422 port.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	Tx	Transmit	Tx–	Transmit (–)
3	Rx	Receive	Rx–	Receive (–)
4	—	Not used	—	Not used
5	Gnd	Ground	Gnd	Ground
6	—	Not used	—	Not used
7	—	Not used	Rx+	Receive (+)
8	—	Not used	Tx+	Transmit (+)
9	—	Not used	—	Not used

Figure 5. Remote Port Wiring

③ **Ethernet port —** If desired, connect a network WAN or LAN hub, a control system, or a computer to the Ethernet RJ-45 port.

Network connection — Wire as a patch (straight) cable.

Computer or control system connection — Wire the interface cable as a crossover cable.

NOTE: The factory default IP address is 192.168.254.254.

④ **Power connector —** Plug the switcher into two grounded AC sources.

NOTE: For reliability, connect the Redundant power cord to either an uninterruptible power source or to a power source that is completely independent from the primary power source.

⑤ **Primary and Redundant power supply indicator LEDs —**

Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply is operating outside the normal tolerances or has failed. See Maintenance and Modifications to replace the power supply.

Front Panel

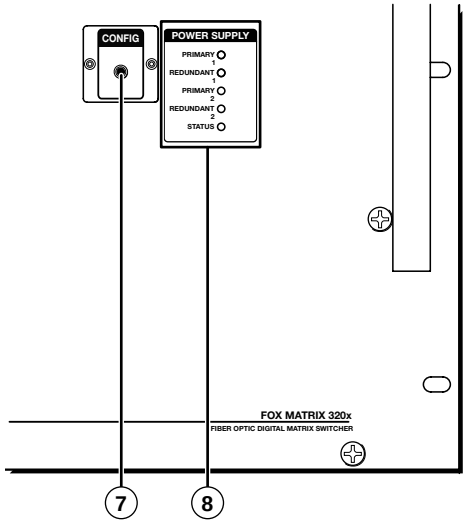


Figure 6. Front Panel Configuration Port, FOX Matrix 320x

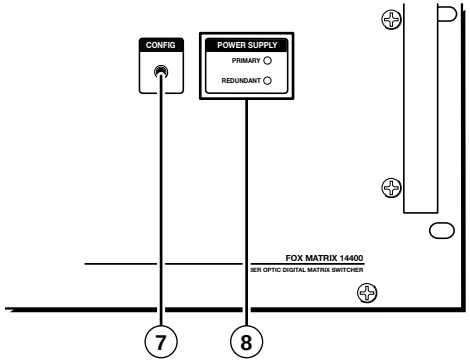


Figure 7. Front Panel Configuration Port, FOX Matrix 1400

⑦ **Configuration port —** If desired, connect a control system or computer to the front panel Configuration (RS-232) port. Use an optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #**70-335-01**.

⑧ **Status LEDs —**

Primary and Redundant Power Supply LEDs —

Green — Indicates that the associated power supply is operating within normal tolerances.

Amber (FOX Matrix 320x only) — Indicates that AC power is disconnected or the power supply has been removed.

Red — Indicates that the associated power supply is operating outside the normal tolerances or has failed. See **Maintenance and Modifications** to replace the power supply.

Status LED (FOX Matrix 320x only) —

Green — Indicates that the controller board is operating normally and that the temperature and backplane voltages are all within normal tolerances.

Red — Indicates that either the controller board has failed or that temperature or backplane voltages are outside of acceptable levels.

Remote Control

This.section.describes.using.the remote control.features.of.the FOX. matrix.switchers.to.control.the devices..Topics.that.are covered. include:

- Selected.SIS™.Commands
- Installing.and.Starting.the Control.Program
- Accessing.the HTML.Pages

Selected SIS™ Commands

You.can.use Simple Instruction.Set.(SIS).commands.for.operation.and. configuration.of.the switchers..You.can.run.these commands.from. a.PC.connected.to.a.serial.port.(item ②.and.⑦).or.Ethernet.port. (item ③).on.the switcher.

Establishing a Network (Ethernet) Connection

NOTE:. If.you.connect.to.the switcher.via.the LAN.port,.and.it. is.the first.time you.have done so,.you.may.change the default.settings.(IP.address,.subnet.mask,.and.[optional]. administrator.name and.password).of.the controller..See Configuring for Network Communication.for.details.

Establish.a.network.connection.as.follows:

1. Open.a.TCP.socket.to.port.23.using.the IP.address.of.the switcher.

   NOTE:. The factory.default.IP.address.is.192.168.254.254.

   The switcher.responds.with.a.copyright.message including.the date,.the name of.the product,.firmware version,.part.number,. and.the current.date and.time.

   NOTES:. • If.the switcher.is.not.password-protected,.the device is.now.ready.to.accept.SIS.commands.
   . • If.the switcher.is.password-protected,.a.`password`. prompt.appears.

2. If.the switcher.is.password-protected, enter.the appropriate password.

   If.the password.is.accepted,.the switcher.responds.with.`Login User`.or.`Login Administrator`.

   If.the password.is.not.accepted,.the `Password`.prompt.reappears.

Connection Timeouts

The Ethernet.link.times.out.and.disconnects.after.a.designated.period. of.time of.no.communications..By.default,.this.timeout.value is.set. to.5.minutes.but.the value can.be changed..See the **Configure port timeout SIS command**.

> **NOTE:**. Extron.recommends.leaving.the default.timeout.at. 5.minutes.and.periodically.issuing.the Query.(Q).command. to.keep.the connection.active or.disconnecting.the socket. and.reopening.the connection.when.necessary.

Number of Connections

A.switcher.can.have up.to.200.simultaneous.TCP.connections,. including.all.HTTP.sockets.and.Telnet.connections..When.the connection.limit.is.reached,.the switcher.accepts.no.new.connections. until.some have been.closed..No error.message or.indication.is.given. that.the connection.limit.has.been.reached..To.maximize performance of.your.switcher,.keep.the number.of.connections.low.and.close unnecessary.open.sockets.

Verbose Mode

Telnet.connections.to.a.switcher.can.be used.to.monitor. for.changes.that.occur.on.the switcher,.such.as.front.panel. operations.and.SIS.commands.from.other.Telnet.sockets.or.a. serial.port..For.a.Telnet.session.to.receive change notices.from. the switcher,.the Telnet.session.must.be in.verbose mode 1.or.3..See the **Set verbose mode SIS command**..In.verbose mode 3,.the Telnet. socket.reports.changes.using.messages.that.resemble SIS.command. responses..

Host-to-Switcher instructions

The switcher.accepts.SIS.commands.through either.serial.port,.the USB.port,.or.the LAN.port..SIS.commands.consist.of.one or.more characters.per.command.field..They.do.not.require any.special. characters.to.begin.or end.the command.character.sequence..Each. switcher.response to.an.SIS.command ends.with.a.carriage return. and.a.line feed.(CR/LF.=.↵),.which.signals.the end.of.the response character.string..A.string.is.one or.more characters.

> **NOTE:**. The table that.begins.on.the next.page is.a.partial.list. of.SIS.commands..For.a.complete listing,.refer.to.the *FOX Matrix 320x and FOX Matrix 14400 User Guide*.

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Create ties			
NOTES: • Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*02&003*003%. • The matrix switchers support 1-, 2-, and 3-digit numeric entries (1*1!, 02*02&, or 003*003%). • The ! tie command, the & tie command, and the % tie command can be used interchangeably. • The ! read tie command, & read tie command, and the % read tie command can be used interchangeably.			
Tie input X1 to output X2	X1*X2!	OutX2•InX1•All↵	Tie input X1 to output X2.
Example (see Note, above):	1*3!	Out003•In001•All↵	Tie input 1 to output 3.
Tie input X1 to output X2	X1*X2&	OutX2•InX1•RGB↵	Tie input X1 to output X2.
Example (see Note, above):	10*4&	Out004•In010•RGB↵	Tie input 10 to output 4.
Tie input X1 to output X2	X1*X2%	OutX2•InX1•Vid↵	Tie input X1 to output X2
Example (see Note, above):	7*5%	Out005•In007•Vid↵	Tie input 7 to output 5.
Read output tie	X2&	X1↵	Input X1 is tied to output X2.
Read output tie	X2%	X1↵	Input X1 is tied to output X2.
Read output tie	X2!	X1↵	Input X1 is tied to output X2.

NOTE: X1 = Input number — 00 – (maximum number of inputs for your configuration) (00 = untied)
X2 = Output number — 01 – (maximum number of outputs for your configuration)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Channel mute commands			
Channel.mute	X2*1B	VmtX2*1↵	Mute output.X2.(no.signal.is.output,.but.the light.output.remains.active).
Channel.unmute	X2*0B	VmtX2*0↵	Unmute output.X2.(signal.is.output).
Read.channel.mute	X2B	X3↵	1.=.mute on,.0.=.mute off.
Global.channel.mute	1*B	Vmt1↵	Mute all.light.outputs.
Global.channel.unmute	0*B	Vmt0↵	Unmute all.light.outputs.
View.output.mutes	Esc VM←	X3[1]X3[2].....X3[n]↵	Each.X3.response is.the mute status.of.an. output,.starting.from.output.1.. *n*.=.the maximum.number.of.outputs.for.your. configuration.
Save and recall presets			
NOTE:. If.you.try.to.recall.a.preset.that.is.not.saved,.the.matrix.switcher.responds.with.the.error.code.E11.			
Save current.configuration.as.a. global.preset	X4,	SprX4↵	Command.character.is.a.comma.
Example:	9,	Spr09↵	Save current.ties.as.preset.9.
Recall.a.global.preset	X4.	RprX4↵	Command.character.is.a.period.
Example:	5.	Rpr05↵	Recall.preset.5,.which.becomes.the current. configuration.

NOTE:.
X2.=.Output.number. . 01.–.(maximum.number.of.outputs.for.your.model)
X3.=.Mute . . 0.=.not.muted,.1.=.muted
X4.=.Global.preset.#. . 01.-.64

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
Information requests			
Information.request	I	VX5XX6•AX5XX6•SX7[1]X7[2]...X7[n]↵	VX5XX6.shows.the number.of.available inputs. and.outputs.for.this.configuration.. AX5XX6.has.no.meaning.for.this.product. SX7[1]X7[2]...X7[n].shows.the board.type installed. in each.slot..*n*.is.9.(FOX.Matrix.14400).or. 20.(FOX.Matrix.320x).
Request.part.number	N	X8↵	
Request.part.number.and.Board. configuration	*N	X8.X7[1]X7[2]X7[3]X7[4]X7[5]X7[6]X7[7]X7[8]X7[n]↵	*n*.is.9.(FOX.Matrix.14400).or. 20.(FOX.Matrix.320x).
Query.controller.firmware version	Q	X9↵	
Example:	Q	1.23↵	The factory-installed.controller.firmware version.is.1.23.(sample value only).

NOTE:.
X5.=.Inputs. . Total.number.of.inputs.for.this.switcher
X6.=.Outputs. . Total.number.of.outputs.for.this.switcher
X7.=.Board.installed. 0.=.No.board.installed
. . . . 1.=.16x16.multimode board.
. . . . 2.=.16x16.singlemode board.
. . . . x.=.Unknown.board.or.mix.of.transceivers.installed.
X8.=.Part.number. 60-*nnnn-nn*
X9.=.Firmware version.number.to.second.decimal.place (x.xx)

Command	ASCII Command (host to unit)	Response (unit to host)	Additional description
IP setup			
Set.IP.address	Esc X10 CI ←	Ipi X10 ↵	
Read.IP.address	Esc CI ←	X10 ↵	
Set.subnet.mask	Esc X10 CS ←	Ips X10 ↵	
Read.subnet.mask	Esc CS ←	X10 ↵	
Set.gateway.IP.address	Esc X10 CG ←	Ipg X10 ↵	
Read.gateway.IP.address	Esc CG ←	X10 ↵	
Set.DHCP.on.or.off	Esc X11 DH ←	Idh X11 ↵	
Read.DHCP.on/off.status	Esc DH ←	X11 ↵	
Set.verbose mode	Esc X12 CV ←	Vrb X12 ↵	
Read.verbose mode	Esc CV ←	X12 ↵	
Configure current.port.timeout	Esc 0* X13 TC ←	Pti0* X13 ↵	
Read.current.port.timeout	Esc 0TC ←	X13 ↵	
Configure global.IP.port.timeout	Esc 1* X13 TC ←	Pti1* X13 ↵	
Read.global.IP.port.timeout	Esc 1TC ←	X13 ↵	

NOTE:. X10.=.IP.address. ###.###.###.###
X11.=.DHCP. . . 0.=.off,.1.=.on
X12.=.Verbose mode . 0.=.clear/none (default.for.Telnet.connection)
. . . . . 1.=.verbose mode (default.for.RS-232/RS-422.connection).
. . . . . 2.=.tagged.responses.for.queries.
. . . . . 3.=.verbose mode and.tagged.for.queries.
X13.=.Port.timeout.interval. 1.(=.10.seconds).-.65000.(default.is.30.=.300.seconds.=.5.minutes)

Installing and Starting the Control Program

Another way to operate the switcher is via the Windows-based Matrix Switchers Control Program. This program is contained on the Extron Software Products DVD (included with the switcher). Run this program on a PC connected to a serial port (item ② and ⑦) or Ethernet port (item ③) on the switcher. The program must be installed on a Windows-based computer and cannot be run from the DVD.

NOTE: For details on operating the program, refer to the "Matrix Software" section in the *FOX Matrix 320x and FOX Matrix 14400 User Guide*.

Installing the Program

1. Insert the DVD into the drive. The Extron software DVD window should appear automatically.

NOTE: If the window does not open automatically, run Launch.exe from the DVD.

2. Click the **Software** tab.
3. Scroll to the Matrix Switchers program and click **Install**.

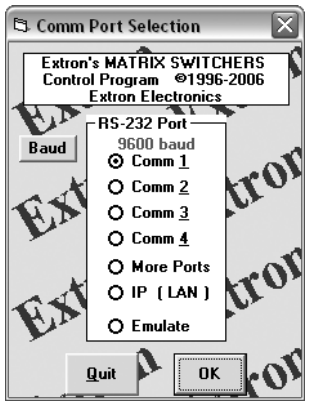
4. Follow the on-screen instructions. The installation program creates a C:\Program Files\Extron\Matrix_Switchers directory and an "Extron Electronics\Matrix Switchers" group folder. It installs the following four programs:

   - MATRIX Switcher+ Control Program
   - MATRIX Switcher+ Help
   - Uninstall MATRIX Switcher
   - Check for Matrix Updates

Starting the Program

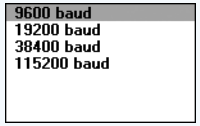
1. Click **Start** > **Programs** > **Extron Electronics** > **Matrix Switchers** > **MATRIX Switcher + Control Pgm**.

   The Comm Port Selection window appears.



2. Choose the comm (serial) port that is connected to the switcher or **IP [LAN]**.

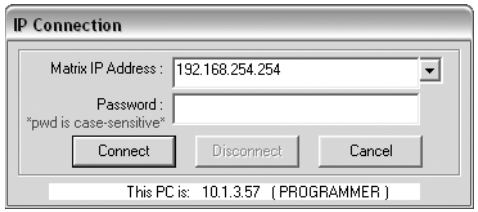
   NOTE: For a comm port, check the baud rate displayed in the Comm Port Selection window. If you need to change the baud rate, click the **Baud** button and double-click the desired baud rate.



   Click **OK**.

   If you selected a serial port in step 2, the Matrix Switchers Control Program is ready for operation.

3. **If you selected IP [LAN] in step 2**, the IP Connection window appears.



   a. Examine the Matrix IP Address field, which displays the last Matrix IP address entered.

      If necessary, enter the correct IP address in the field.

      NOTE: 192.168.254.254 is the factory-specified default value for this field.

   b. If the switcher is password-protected, enter the appropriate administrator or user password in the Password field.

   c. Click **Connect**. The Matrix Switchers Control Program is ready for operation.

Accessing the HTML Pages

Another way to operate the switcher is via its factory-installed HTML pages, which are always available and cannot be erased or overwritten. The HTML pages pre-loaded on the switcher are accessible through its LAN port, connected via a LAN or WAN, using a web browser such as Microsoft Internet Explorer. See item ⑦, on page 10, for connection information.

Configuring for Network Communication

The first time you connect a PC to a switcher via its LAN port, you may need to temporarily change the IP settings of the PC in order to communicate with the controller. Then you must change the default settings of the controller (IP address, subnet mask, and [optional] administrator name and password) in order to use the unit on an intranet (LAN) or on the Internet. After you have set up the FOX matrix switcher for network communication, you can reset the PC to its original network configuration.

NOTE: The computer and the switcher must both be connected to the same subnet on a LAN (using a straight-through cable). Alternatively, you can use a crossover Ethernet cable to connect the controller directly to the computer.

Use the ARP command to configure the IP address as follows:

1. Obtain a valid IP address for the FOX matrix switcher from the network administrator.
2. Obtain the MAC address (UID #) of the switcher from the label on its rear panel. The MAC address should have this format: 00-05-A6-*xx-xx-xx*.
3. If the switcher has never been configured and is still set for factory defaults, go to step **4**. If not, perform a Mode 4 system reset. For detailed information on reset modes, refer to "Reset Operations" in the *FOX Matrix 320x and FOX Matrix 14400 User Guide*.

   NOTE: The switcher must be configured with the factory default IP address (192.168.254.254) before the ARP command is executed, as described below.

4. At.the PC,.access.the MS-DOS®.command.prompt,.then enter.the *arp –s*.command..Type in.the desired.new.IP.address.for.the unit. (obtained.in.step.**1**).and.the MAC.address.of.the unit.(from.the rear.panel.of.the unit)..For example:. *arp –s 10.13.197.7 00-05-A6-03-69-B0*.and.then.press. {Enter}.

   After.receiving.the `arp -s`.command,.the controller.changes.to. the new.address.and.starts.responding.to.the ping.requests,.as. described.in.step.**5**.

   NOTE:. You.must.ping.the FOX.matrix.switcher.as.shown.in. step.5.for.the IP.address.change to.take place..The response should.show.the new.IP.address,.as.shown.in. the following.figure.

5. Execute a.ping.command.by entering.“ping”.followed.by.a.space and.the new.IP.address.at.the command.prompt..For example:. *ping 10.13.197.7*

```
C:\>ping 10.13.197.7

Pinging 10.13.197.7 with 32 bytes of data:

Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128

Ping statistics for 10.13.197.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

   NOTE:. You.can.reconnect.using either.Telnet.or.a.Web. browser.to.verify.that.the update was.successful.

6. After.verifying.that.the IP.address.change was.successful, enter. and.issue the “arp.–d”.command.at.the DOS.prompt..For example:

   arp –d 10.13.197.7.removes.10.13.197.7.from.the ARP.table or.
   *arp –d**.removes.all.static.IP.addresses.from.the ARP.table.

Loading the Start-up Page

NOTES:. • If.your.Ethernet.connection.to.the matrix.switcher. is.unstable,.try.turning.off.the proxy.server.in.your. Web.browser..In.Microsoft.Internet.Explorer,.click. **`Tools`**.>.**`Internet Options`**.>.**`Connections`**.>.**`LAN Settings`**,.uncheck.the **`Use a proxy server...`**. box,.and.then.click.**OK**.

. • For.details.on.operating.the switcher.via.HTML. pages,.refer.to.the "HTML.Operation".section.in.the *FOX Matrix 320x and FOX Matrix 14400 User Guide*.

1. Start.the Web.browser.program.
2. Click.in.the Address.field.
3. Enter.the Matrix.IP.address.in.the Address.field.

   NOTE:. 192.168.254.254.is.the factory-specified.default.value for.this.field.

4. Press.the keyboard.Enter.key..The switcher.checks.to.see if.it.is. password-protected.

   If the switcher is not password-protected,.it.checks.and. downloads.the HTML.start-up.page..The switcher.is.ready.for. operation.via.HTML.remote control.

   If the switcher is password-protected,.it.downloads.the Enter. Network.Password.page.

   NOTE:. A.User.name entry.is.not.required.

5. Enter.the appropriate administrator.or.user.password.in.the Password.field.and.click.**OK**.
6. The switcher.downloads.the HTML.start-up.page..The switcher.is. ready.for.operation.via.HTML.remote control.

Maintenance and Modifications

This.section.describes.repairing.and.reconfiguring.the FOX.matrix. switchers.by.replacing.components..Topics.that.are covered.include:

- Removing.and.Installing.an.I/O.Board.or.Blank.Panel
- Removing.and.Installing.a.Power.Supply.Module
- Removing.and.Installing.a.Fan

Removing and Installing an I/O Board or Blank Panel

Circuit.boards.can.be added.or.removed.to.increase or.decrease the I/O.configuration.(size).of.the switcher.

WARNING:. The fiber.optic.I/O.boards.of.the FOX.matrix. switchers.output.continuous.invisible light,.which. may.be harmful.to.the eyes;.use with.caution.

- ***Do not look***.into.the fiber.optic.cable connectors. or.into.the fiber.optic.cables.themselves.
- Plug.the attached.dust.caps.into.the optical. transceivers.when.the fiber.cable is.unplugged.

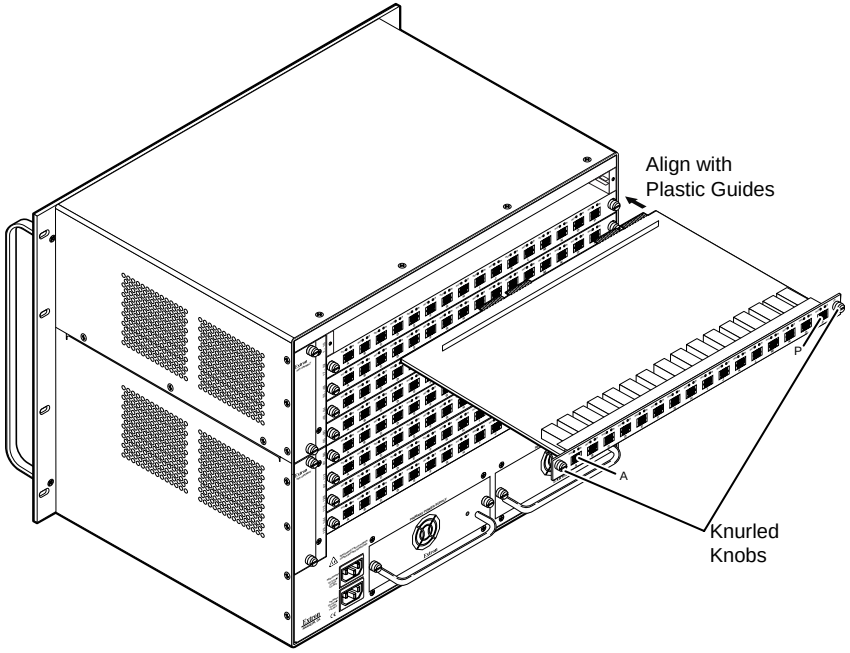
NOTES:. •. On.a.fiber.optic.I/O.board.as.delivered.from.Extron,.all. transceiver.modules.are configured.the same: either.all. multimode or.all.singlemode.. You.can.mix.multimode and.singlemode fiber.optic.I/O. boards.in.a.FOX.matrix.switcher,.but.you.must ensure that.you.connect.the proper.transmission.mode fiber. cables.to.the board..

- Typically,.singlemode fiber.has.a.yellow.jacket.and. multimode cable has.an.orange or.cyan.jacket.
- For.proper.cooling.and.air.flow,.boards.and/or.blank. panels.should.be installed.in.all.locations.during.normal. switcher.operations.
- See A Note on I/O Boards.to.understand.the different. arrangement.of.connectors.on.the I/O.boards.

Remove and replace an I/O board or blank panel as follows:

NOTE: The I/O boards are hot-swappable. You do not need to power down the switcher to remove an I/O board.

1. **For an I/O board**, disconnect any connected cables.
2. Rotate the left and right knurled knobs to completely loosen the captive screws.
3. Gently pull on the knurled knobs/captive screws to loosen the board or panel from the backplane.
4. Slide the board or panel out of the chassis (below).



CAUTION: Do not touch the electronic components or the connectors on the backplane or on the circuit boards without being electrically grounded. Handle circuit boards by their edges only. Electrostatic discharge can damage circuits, even if you cannot feel, see, or hear it.

5. Place the removed board on an anti-static surface or in an anti-static container.
6. **For an I/O board**, orient the board to be installed so that transceiver module A (fiber board) is on the left and transceiver module P is on the right.
7. **For an I/O board**, align the board with the left and right chassis guides (above).
8. Gently slide the board or blank panel into the enclosure. For an I/O board, slide the board toward the front panel until it meets resistance.
9. Gently seat the board or panel in the backplane.
10. Use a screwdriver to tighten the left and right knurled knobs/captive screws to lock the board or panel in place.

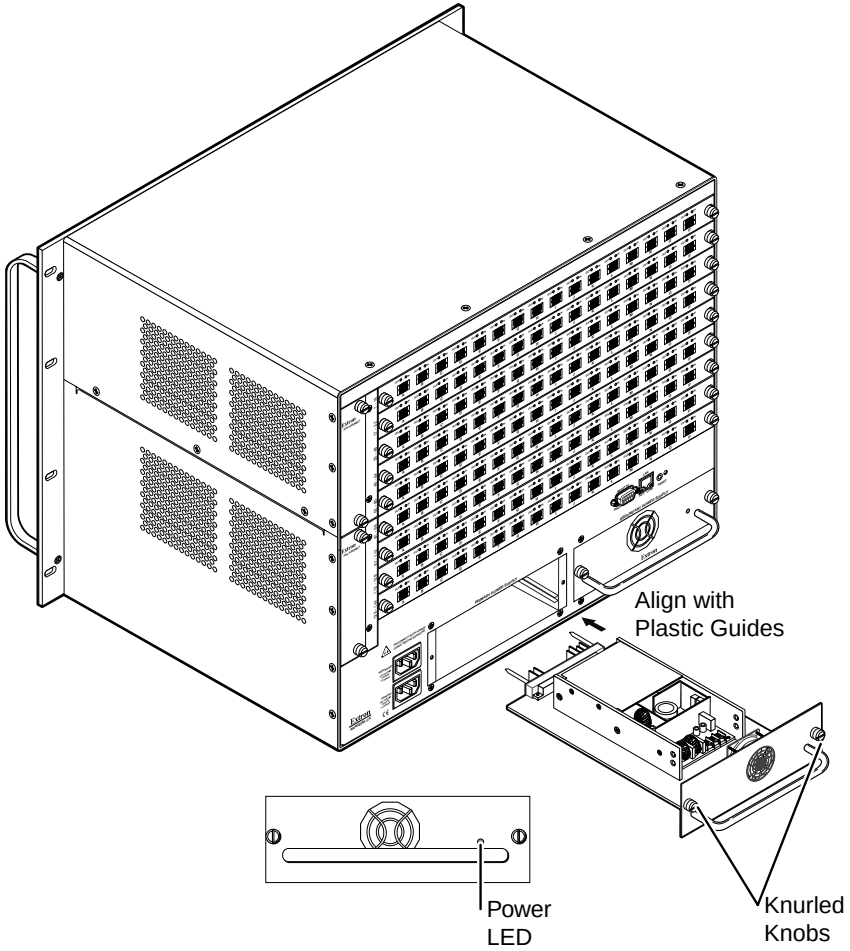
Removing and Installing a Power Supply Module

The FOX Matrix 14400 has two power supply modules and the FOX Matrix 320x has four power supply modules. The modules for each model are identical and hot-swappable. Each power supply module has a 2-color LED, visible on the rear panel, that indicates the status of the power supply outputs. If the LED is lit green, the power supply is operating normally. If the LED is lit red, the supply has failed and should be replaced at the earliest opportunity. LEDs with identical meaning are also on the front panel.

CAUTION: The FOX matrix switchers use double pole/neutral fusing. Power must be disconnected before servicing internal components.

NOTES:
- Power supply modules are not interchangeable between models.
- The power supply modules are hot-swappable. Either power supply can be removed without powering down the switcher. You do not need to power down the switcher to install a power supply module.

1. Rotate the left and right knurled knobs to completely loosen the captive screws.
2. Gently pull on the handle to loosen the power supply from the backplane.
3. Slide the power supply out of the chassis.
4. Orient the power supply module to be installed with the LED up (FOX Matrix 320x) or to the right (FOX Matrix 14400).
5. Align the flanges on the power supply module with the left and right power supply guides (see the next page).
6. Gently slide the power supply module into the enclosure until the power supply meets resistance.
7. Gently seat the power supply in the backplane.
8. Use a screwdriver to tighten the left and right knurled knobs/captive screws to lock the power supply in place.

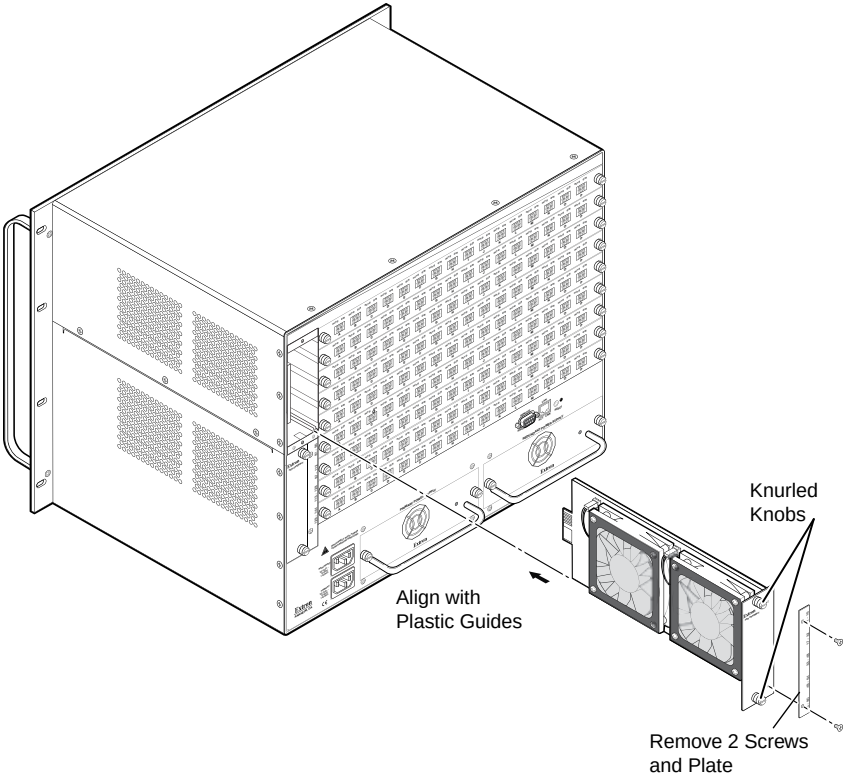


Removing and Installing a Fan

The FOX.Matrix.14400.has.two.fan.modules.and.the FOX.Matrix.320x. has.four.fan.modules..The fan.modules.for each.model.are identical. and.hot-swappable..If.a.fan.fails,.it.should.be replaced.at.the earliest. opportunity.

NOTES:. • Fans.are not.interchangeable between.models..
• The fans.modules.are hot-swappable..Either.fan.can. be removed.or.installed.without.powering.down.the switcher.

1. Remove and.retain.the two.screws.that.secure the row. identification.plate (identifying.rows.1.through.80,.rows.81. through.144,.rows.81.through.160,.rows.161.through.240,.or.rows. 241.through.320).to.the fan..Retain.the plate.
2. Rotate the top.and.bottom.knurled.knobs.to.completely.loosen. the captive screws.
3. Gently.pull.on.the screws.to.loosen.the fan.from.the backplane.
4. Slide the fan.out.of.the chassis.
5. Orient.the fan.to.be installed.so.that.the printing.on.the back.of. the panel.is.right-side up.
6. Align.the flanges.on.the fan.with.the top.and.bottom.fan.guides. (see the next.page).
7. Gently.slide the fan.into.the enclosure until.the fan.meets. resistance.
8. Gently.seat.the fan.in.the backplane.
9. Use a.screwdriver.to.tighten.the top.and.bottom.knurled.knobs/ captive screws.to.lock.the fan.in.place.
10. Secure the row.identification.plate to.the fan.


Knurled
Knobs
Align with
Plastic Guides
Remove 2 Screws
and Plate